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Erik Dahlman

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ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR 1-C-11
PLANO, TX 75024

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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ERIK DAHLMAN, HENRIK ANDREASSON,
MAGNUS SUNDELIN, BO GORANSSON,
and STEFAN PARKVALL

Appeal 2007-3053
Application 09/873,309
Technology Center 2600

Decided: January 8, 2008

Before KENNETH W. HAIRSTON, ROBERT E. NAPPI,
and KARL D. EASTHOM, *Administrative Patent Judges*.

EASTHOM, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134(a) from the Final Rejection of claims 1-20. We have jurisdiction pursuant to 35 U.S.C. § 6(b).

BACKGROUND

The claims are directed to a method of transmitting information in a radio communication system having at least a first and second channel. The level of power of information transmitted in the second channel is used to control the choice of the modulation and/or coding scheme in the first channel.

Claim 1 is illustrative of the claims on appeal:

1. A method of transmitting information in a radio communication system comprising at least one transmitter and at least one receiver, the method comprising the steps of:

transmitting first information in a first channel from the at least one transmitter to the at least one receiver, using in the transmitting a modulation and/or coding scheme and adapting the modulation and/or coding scheme to give a secure communication of the first information, and

transmitting second information in a second channel from the at least one transmitter to the at least one receiver and setting the power used for transmitting in the second channel to give a secure communication of the second information, wherein in the step of transmitting the first information, the choice of the modulation and/or coding scheme is controlled by the level of the power at each instant set for transmitting in the second channel.

The References

Willenegger	US 2002/0009061	Jan. 24, 2002
Baum	US 6,385,462 B1	May 7, 2002
Balachandran	US 6,567,375 B2	May 20, 2003

Rejections Appealed

Claims 1-13 and 15-20 stand rejected under 35 U.S.C. § 103 as being unpatentable over Willenegger in view of Baum.

Claims 14 stands rejected under 35 U.S.C. § 103(a) as unpatentable over in view of Baum, further in view of Balachandran.

Appellants contend that the Examiner fails to make out a prima facie case of obviousness because the combination of Willenegger and Baum does not teach all of the claim limitations (Br. 4). Specifically, Appellants contend that the reference disclosures do not teach the claim element of “wherein the choice of the **modulation and/or coding scheme** for information transmitted in a **first** channel is controlled by the level of power at each instant set for transmitting in a **second** channel.” (Br. 7) (emphasis original). Appellants do not separately argue the rejected claims; thus we group claims 1 through 13, and 15 through 20 of the rejected claims together. We take claim 1 as representative of the claims on appeal. See 35 C.F.R. § 41.37(c)(1)(vii).

Issue

The issue is whether Appellants have met their burden on appeal of asserting error in the Examiner’s obviousness rejection of claim 1 under 35 U.S.C. § 103 based on the combination of Willenegger and Baum.

We affirm.

PRINCIPLES OF LAW

On appeal, Appellants bear the burden of showing that the Examiner erred. Appellants may sustain this burden by showing that, where the Examiner relies on a combination of disclosures, the Examiner failed to provide sufficient evidence to show that one having ordinary skill in the art would have done what Appellants did. *United States v. Adams*, 383 U.S. 39, 47 (1966); *In re Kahn*, 441 F.3d 977, 987-988 (Fed. Cir. 2006); *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick, Co.*, 464 F.3d 1356, 1360-1361 (Fed. Cir. 2006).

Appellants may also show that the Examiner has failed to meet his initial burden of presenting a prima facie case of obviousness. *In re Oetiker*, 977 F.2d 1443, 1445 (Fed. Cir. 1992). If that burden is met, then the burden shifts to the Appellants to overcome the prima facie case with argument and/or evidence. *See Id.*

The Examiner's articulated reasoning in the rejection must possess a rational underpinning to support the legal conclusion of obviousness. *In re Kahn*, 441 F.3d 977, 988 (Fed. Cir. 2006).

"[W]hen a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1740 (2007).

For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Sakraida and Anderson's-Black Rock* are illustrative – a court must

ask whether the improvement is more than the predictable use of prior art elements according to their established functions.

Id.

FINDINGS OF FACT

1. Appellants' disclosed system maps power from one channel to the coding or modulation scheme in another channel. (Spec. 11-12).

2. Appellants admit: "Compared to conventional systems...the method according to fig. 2 is new with respect to two features. First, the inventive idea resides in the mapping of the power used in the dedicated physical channel into a suitable modulation and coding scheme. Secondly, in the method according to the invention, a varying modulation coding scheme is used on the downlink shared channel." (Spec. 11: 11-17).

3. In Appellants' W-CDMA system, to control the modulation scheme, power (P_{DPCH}) from the second channel, a downlink physical channel (DPCH), is implemented in the form of a table (Table 2), to determine the modulation scheme for the first channel, a downlink shared channel (DSCH). (Spec. 9, 11-12).

Appellants' Table 2 is reproduced below.

P_{DPCH} power range (in percent of full power)	MCS	Code rate	Modulation
$P_{\text{DPCH}} \geq P_1 = 60\%$	MCS_1	1/2	QPSK
$60\% = P_1 > P_{\text{DPCH}} \geq P_2 = 50\%$	MCS_2	3/4	QPSK
$50\% = P_2 > P_{\text{DPCH}} \geq P_3 = 30\%$	MCS_3	1/2	8PSK
$30\% = P_3 > P_{\text{DPCH}} \geq P_4 = 20\%$	MCS_4	3/4	8PSK
$20\% = P_4 > P_{\text{DPCH}} \geq P_5 = 15\%$	MCS_5	1/2	16QAM
$15\% = P_5 > P_{\text{DPCH}} \geq P_6 = 10\%$	MCS_6	3/4	16QAM
$10\% = P_6 > P_{\text{DPCH}} \geq P_7 = 5\%$	MCS_7	1/2	64QAM
$5\% = P_7 > P_{\text{DPCH}}$	MCS_8	3/4	64QAM

Appellants' Table 2 depicts decreasing power ranges from a downlink physical channel mapped to modulation types with increasing data rates for a downlink shared channel (Spec. 12).

The terms QPSK and QAM, respectively, mean Quaternary Phase Shift Keying and Quadrature Amplitude Modulation, while the integers 8, 16, and 64 indicate the amount of signaling alternatives (Spec. 12). Low transmitted power indicates signal quality is high, while high transmitted power indicates signal quality is low (Spec. 13).

4. Appellants admit that it is known to employ a technique whereby the modulation or data rate of a radio channel is selected based on information about the quality of the radio channel (Spec. 1-2). The technique is known as "link adaptation." "Link adaptation can be accomplished by, e.g. changing the modulation and/or channel coding scheme (MCS)." (Spec. 2: 1-9). Appellants further describe link adaptation as follows: If the radio channel quality is high, the transmitter can exploit

the high quality by transmitting at a higher data rate (either by reducing redundancy or employing higher order modulation or other methods). On the other hand, if the radio channel quality is low, the data rate is adjusted to be lower to ensure more reliable transmission. (Spec. 1:17 to 2:9). The quality of the radio channel can be determined in a number of ways. One known way involves “estimat[ing] the received signal-to-interference ratio[,]by measuring the received signal strength of a signal transmitted at a known constant power, such as a pilot signal, and the overall interference.” (Spec. 2: 16-21).

5. Appellants also admit that: “Generally speaking, methods for controlling the coding scheme and power level based on explicit feedback information from the receiver are well known for a person skilled in the art, as disclosed above.” (Spec. 5: 16-19).

6. Baum teaches associating a signal quality with transmit power in a link to assign a modulation/coding rate (“MCR”) to that link. In one embodiment employing multiple links, the modulation/coding rate MCR is assigned as a common MCR for all the links based on a common target signal quality for all the links. (Col. 4, ll. 17-28). Baum’s method is “advantageously applied” to “WCDMA” (wideband code division multiplex) systems (col. 10, ll. 22-30).

7. Willenegger teaches using commands from an inner power control loop in a second channel, a downlink physical channel (“DPCH”), to control the transmitted power in a first channel, a physical downlink shared channel

("PDSCH"), in a W-CDMA system. Power is controlled to obtain target SNR ratios in each channel (Par. 0036, 0047).

ANALYSIS

Appellants' argument that the Examiner fails to establish a prima facie case of obviousness is founded on the premises: 1) that Willenegger does not teach using power in a first channel to determine the modulation/coding scheme in a second channel, and 2) that Baum teaches controlling the modulation scheme in one channel based on power information from that same channel (Br. 7). The Examiner generally agrees with Appellants' premises as Appellants implicitly acknowledge (Br. 7-8, Ans. 4). We also find the premises factually supported (FF 6, 7).

However, Appellants fail to respond to the Examiner's contention that the combination of Willenegger with Baum meets the claim limitations. Accordingly, we conclude that Appellants have failed to sustain their burden on appeal.

We conclude as the Examiner does that the combination of Willenegger and Baum teach the invention. The Examiner explains:

The combination of Willenegger and Baum render a first channel (PDSCH) with an adaptive modulation and/or coding scheme that is dependent on the power level of the PDSCH. The power level of the PDSCH is dependent on the power level of the DPCH thus the modulation and/or coding scheme of the PDSCH will ultimately depend on the power level of the DPCH. The combination of Willenegger and Baum thus render the claimed invention.

(Ans. 14).

We find the Examiner's explanation to be factually supported and logically sound. First, we find, as the Examiner does, that in Willenegger's system, "the power level of the PDSCH is dependent on the power level of the DPCH" (Ans. 14 quoted above, see FF 7). Appellants do not challenge this finding. In other words, power in the second channel, the physical channel (DPCH), is used to control the power in the first channel, the shared channel (PDSCH) (see FF 7).

Second, we concur with the Examiner's finding that Baum "teaches a selection of a modulation and/or coding scheme for a channel that is controlled by the level of power of [sic] at each instant set for transmitting in said channel" (Ans. 13, see FF 6).¹ Appellants' contend that "Baum discloses using the signal quality associated with the transmit power assigned to a link to control the choice of modulation and/or coding on that same link." (Br. 7: 30 to 8:1)(emphasis original, citing Baum (col. 4, ll. 19-25)).

¹ Appellants do not accept the Examiner's characterization of Baum's teaching as correct, but instead, assume it is correct for purposes of argument (Ans. 6). Appellants' implied counter argument is that the limitation "controlled by the level of power at each instant set" requires control based on instantaneous transmitted power (Ans. 13). Baum teaches that "link adaptation may be performed once every frame" (col. 8, ll. 40-50). Therefore, even if we accept Appellants' implied argument that the claim requires instantaneous power, we determine that Baum meets the limitation. We also note that Appellants do not include instantaneous power in either of the two inventive ideas they identify as embodied in their invention (FF 2).

We also find Appellants' contention factually supported. As both contentions are factually supported, and because Appellants accept the Examiner's contention as correct for purposes of argument (see n.1 above), we decline to resolve any differences between the two contentions. We also find that Baum teaches what Appellants admit is well-known – “link adaptation” – using the signal power in a link to determine, based on the desired signal quality in the channel, a modulation and/or channel coding scheme (MCS) (or modulation and/or data rate (MCR)) in order to satisfy the desired signal quality (see FF 4-5).² We note that Baum and Appellants disclose that the link adaptation technique is advantageous for W-CDMA systems (FF 3, 4, 6).

Willenegger also teaches a W-CDMA system.³ Because Willenegger teaches using power in the second channel to control power in the first channel, and Baum teaches using power in the first channel to determine the modulation and/or coding schedule or rate in the first channel it follows that the combination renders the result as advanced by the Examiner (Ans. 14 as quoted above); i.e., power in the second channel ultimately controls the

² We also note that Baum discloses assigning power in one link depending on the total power available to all the links and depending on a target C/I (signal quality). Hence the power in a link depends on the power in another link. Baum also teaches link adaptation or assigning the “modulation/coding rate based on the target C/I”. (Baum, col. 5, ll. 35-65). Therefore, Baum's teachings imply that power in a one channel ultimately determines modulation in another link.

³Appellants' and Baum's systems each employ physical and shared channels (FF 3, 7).

modulation and/or coding scheme in the first channel.⁴ Consequently, we are persuaded by the Examiner's unchallenged explanation that the combination of the Willenegger and Baum references meets claim 1.

We are not persuaded by Appellants' separate attacks on each reference. *In re Keller*, 642 F.2d 413, 426 (CCPA 1981) ("one cannot show non-obviousness by attacking references individually where, as here, the rejections are based on combinations of references"). As indicated above, what the references individually teach is not disputed in a dispositive or material manner. Following *Keller*, we determine that the arguments that Baum's teaching is limited to a single channel and that neither Baum nor Willenegger discloses that power in a second channel controls the modulation or coding scheme in a first channel (Br. 7) are not material to the obviousness issue here involving the Examiner's proposed combination of the references.

We also note that Appellants do not challenge the Examiner's reasons given to support the combination of Willenegger and Baum (Ans. 14). We find that the Examiner's rationale is clearly articulated and sufficiently provides a sound basis to suggest the combination as proposed. We adopt those reasons as our own here. We summarize by stating that we agree with the Examiner that each reference is concerned with enhancing signal quality and that Baum teaches a well-known way to enhance it (Ans. 14).

⁴ Appellants' argument that Baum's teaching is limited to a single channel renders the result advanced by the Examiner since the teaching is applied to the single shared channel – the first channel of the claim.

We determine that a person of ordinary skill in the art would have recognized that Baum's well-known prior art link adaptation technique applied in a W-CDMA system would have improved Willenegger's W-CDMA system in the same way, rendering the combination no more than the predictable use of a prior art technique according to its established function. We also determine that the combination meets the elements of claim 1.

CONCLUSION

Appellants fail to meet the burden of asserting error in the Examiner's rejection. *See United States v. Adams*, 383 U.S. at 47 (1966); *In re Kahn*, 441 F.3d at 987-988 (Fed. Cir. 2006); *DyStar Textilfarben GmbH & Co. Deutschland KG v. C.H. Patrick, Co.*, 464 F.3d at 1360-1361 (Fed. Cir. 2006). Appellants did not file a Reply Brief challenging the Examiner's findings. Based on the arguments made in the Brief, we have no basis for questioning the unchallenged findings of the Examiner. Appellants have not sustained their burden on appeal of showing that the Examiner erred in rejecting the claims on appeal as being unpatentable under 35 U.S.C. § 103(a).

Accordingly, we sustain the Examiner's rejection of claim 1. Appellants have not separately argued claims 2- 13 and 15-20. Therefore, we also sustain the Examiner's rejections of claims 2-13 and 15-20.

Further, as Appellants has not presented arguments directed to the Examiner's rejection of claim 14, we sustain the Examiner's rejection of claim 14 for the reasons discussed above with respect to claim 1.

DECISION

The decision of the Examiner is *affirmed*.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

Appeal 2007-3053
Application 09/873,309

KIS

ERICSSON INC.
6300 LEGACY DRIVE
M/S EVR 1-C-11
PLANO, TX 75024